OMICS International
conferenceseries.com

Oral Health Dent Manag 2015, 14:4
http://dx.doi.org/10.4172/2247-2452.S1.013

4th Asia Pacific Congress & Expo on
Dental and Oral Health
July 27-29, 2015 Brisbane, Australia

Platelet rich fibrin: The talk of the town in regenerative periodontics

Saurabh Lall
The Dental Hub, USA

Regeneration is defined as the reproduction or reconstitution of a lost or injured part of the body in such a way that the architecture and function of the lost or injured tissues are completely restored. The inference of wound healing in dental tissues may be repair or regeneration, depending on the nature of the wound; the availability of progenitor cells; signalling molecules; and micro-environmental cues such as adhesion molecules, extracellular matrix, and associated non-collagenous protein molecules. Since repair is not the ideal outcome of wound healing, approaches with the objective of restoration of lost tissues (periodontal ligament, alveolar bone, cementum, and connective tissue) have been preferred by most researchers. Platelet-rich fibrin (PRF), developed in France by Choukroun et al., is a new second generation platelet concentrate widely used to accelerate soft and hard tissue healing. It is an immune and platelet concentrate with specific composition, three dimensional architecture and associated biology that collects all the constituents of a blood sample to favour wound healing and immunity. A complex natural scaffold ideally suited for autologous tissue regeneration, platelet-rich fibrin (PRF) is an improvement over the earlier introduced platelet-rich plasma (PRP) as an aid for tissue repair and regeneration. In contrast to PRP, which was prepared by adding bovine thrombin and anticoagulants, PRF is generated from centrifuged blood and is strictly autologous. PRF predominantly consists of a fibrin matrix rich in platelet and leukocyte cytokines and growth factors. Fibrin gels exploit the final stage of the coagulation cascade in which fibrinogen molecules self assemble into a highly biocompatible three-dimensional fiber network. Clinical studies have demonstrated that PRF promotes soft tissue and bone regeneration, as well as periodontal tissue regeneration. The ability of PRF to augment and regenerate compromised tissues may be enhanced in combination with bone substitutes such as Bio-Oss or autologous bone. Together, these studies have established PRF as a highly biocompatible and inductive scaffold useful for a broad range of tissue engineering applications. Its advantages over the better known platelet-rich plasma (PRP) include ease of preparation/application, minimal expense, and lack of biochemical modification (no bovine thrombin or anticoagulant is required). PRF is a strictly autologous fibrin matrix containing a large quantity of platelet and leukocyte cytokines. PRF is easy to obtain, less costly, and a possibly very beneficial ingredient to add to the "regenerative mix." PRF is both a healing and inter-positional biomaterial. As a healing material, it accelerates wound closure and mucosal healing due to fibrin bandage and growth factor release. As interpositional material, it avoids the early invagination of undesired cells, thereby behaves as a competetive barrier between desired and undesired cells. According to Simonpieri et al, the use of this platelet and immune concentrate during bone grafting offers the following 4 advantages: First, the fibrin clot plays an important mechanical role, with the PRF membrane maintaining and protecting the grafted biomaterials and PRF fragments serving as biological connectors between bone particles. Second, the integration of this fibrin network into the regenerative site facilitates cellular migration, particularly for endothelial cells necessary for the neo-angiogenesis, 24 vascularization and survival of the graft. Third, the platelet cytokines are gradually released as the fibrin matrix is resorbed, thus creating a perpetual process of healing. Lastly, the presence of leukocytes and cytokines in the fibrin network can play a significant role in the self-regulation of inflammatory and infectious phenomena within the grafted material.

saurabhlall.delhi@gmail.com